

# dying for a drink

## RUNNING THE RAPTOR GAUNTLET AT KALAHARI WATERHOLES

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A massive Kalahari lion lies in the deep shade of a camelthorn tree. Both the tree and the lion seem stooped under the pressure of the shimmering desert heat. Only metres away, two biologists sit cramped and sweating in the cab of their vehicle, nosed in under the shade of the spiky outer branches of the camelthorn. The two men seem oblivious to the big cat, and instead stare fixedly at the nearby waterhole, exposed and bare in the sun, and lifeless except for a small flock of sparrows, chirping and drinking at the water's edge.

As the birds undulate their way back to the shelter of the tree, the air is suddenly ripped by the blurred passage of a Lanner Falcon. Instantly, a small, feathered life is ended, and the falcon wings away low over the red sand with its inert victim.

The details of this clinical assassination are studiously recorded by the occupants of the vehicle, before they settle back to await the next avian murder. Beside them, the lion shifts slightly and yawns... ▶

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**I**n August 1997 we were contracted as scientific advisors to the production team of David Attenborough's 'Life of Birds' series. Our brief was to assist with the filming of Lanner Falcons hunting at waterholes in what is now the Kgalagadi Transfrontier Park (KTP). We opted to spend three weeks casing the area for the best times and locations for filming before the BBC cameraman arrived to get the shot he needed. We subsequently spent another fortnight actually filming. At the outset, we decided to put all this field-time to good use by trying to quantify raptor strike rates and efficiencies, and simultaneously recording the drinking schedules of the main prey species.

Buoyed by our experiences on this first trip, we returned to the area 18 months later, in March 1999, for another two-week stint in the park. While our efforts fell short of achieving even a workable understanding of avian predator-prey interactions, we did at least document the spectacle of frenzied bird aggregations and scything raptor attacks that form part of the daily cycle of events at waterholes in this, southern Africa's 'harshest paradise'.

**T**here are two fundamental qualities of the Kalahari that soon become apparent to fieldworkers and regular visitors. One is that conditions are completely unpredictable. For example, the late Richard Liversidge spent more than 20 years trying to unravel patterns of raptor movement into and out of the southern Kalahari, trying to find a satisfactory explanation for enormous differences in the scale of annual migratory influxes to the area. While this degree of unpredictability certainly adds spice to the Kalahari experience, it can also be the source of enormous frustration when trying to plan, execute and interpret scientific observations.

The second feature of the area is much better news for students of predation: virtually every animal in the reserve kills and eats every other. An additional bonus is that this ongoing bloodbath is often staged around waterholes or ▷

**Right** *Just after impact – an adult Lanner sends a Cape Turtle Dove tumbling during a successful strike. We watched an apparently resident pair of Lanners hunting doves almost every morning at Cubitje Quap. Taking up perches some hundreds of metres away from the waterhole, they waited until the number of drinking doves reached a feverish maximum before making their next sortie, dropping to build up speed and powering in only inches above the ground to maximise surprise and panic at the critical moment.*

**Previous spread** *The participants may be relatively small, but the interplay between raptors and drinking birds at Kalahari waterholes is far more dramatic than most visitors' experiences of the larger, hairy predators and their antelope prey. Here a flock of Red-headed Finches loses its nerve and breaks for cover after a hurried visit to water.*





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*The Red-necked Falcon is a voracious and highly efficient predator. It generally hunts smaller birds, but this female has secured a turtle dove at least half her body weight.*

in the dry Nossob and Auob riverbeds, within spitting distance of the roads travelled by tourists.

While the act of predation is notoriously difficult to observe, particularly when the participants are small, fast-moving birds, we found the Kalahari waterholes to be unique in the frequency with which dramatic and clearly observable raptor strikes played out within metres of our car. The 'waterholes' are actually wind-pumped boreholes that provide the area's wildlife with an artificially reliable, year-round source of water in what is otherwise a typically arid environment. Many of the waterholes attract large numbers of thirsty birds every day. These are mostly seed-eating species that obtain very little of their water requirements from

their food and are largely dependent on sources of free-water. The combination of these large aggregations of drinking birds, high bird-eating raptor densities and very open, almost cover-free habitats around the waterholes sets the scene for some action-packed thrills and spills, available to any audience with an eye for a bird and a modicum of patience.

Another advantage of the Kalahari as a venue for observing avian predation is the simplicity of the system. Apart from the structural simplicity and openness of the environment, bird diversity in the area is generally low. During our time in the field, only about 10 or 11 species were regular participants in proceedings at the

waterholes. There were three key raptors: the 'large' Lanner Falcon, the 'small to medium-sized' Red-necked Falcon (both of which are essentially open-country predators that catch or strike prey in the open) and the 'small' Gabar Goshawk (a more stealthy, smash-and-grab operator, quite prepared to pursue prey into cover). These birds attended the waterholes to prey on a maximum of only eight potential prey species that formed three functional groups. The 'large' Spotted and Namaqua sandgrouse (desert species that commute tens of kilometres daily to reach water), the 'medium-sized' Cape Turtle and Namaqua doves, and the 'small' finches, in our case mainly Cape Sparrows, Red-headed and Scaly-feathered finches and Sociable Weavers.

Quite early on in the proceedings, we discovered that both predators and prey were rather particular about when they chose to drink and hunt. The sandgrouse, for example, came to water on a very restrictive time schedule. They arrived in vocal single- or mixed-species flocks two to three hours after sunrise, often stopping to gather into larger flocks nearby before swarming to the waterhole in frenzied waves. Well in excess of 1 000 birds drank on any one morning at favoured waterholes, all within a period of about two hours. Then, as suddenly as they had appeared, they miraculously vanished back into the desert, leaving only an echo of their massed voices.

Finch flocks and Cape Turtle Doves had both morning and late afternoon drinking peaks, although finches visited the waterholes throughout the day. Doves peaked earlier and later in the day than finches, at least partly because the smaller birds seemed reluctant to go to water when large numbers of doves were present. Likewise, during the frantic morning influx of sandgrouse at certain waterholes, the doves tended to thin out, leaving the grouse to their own devices. Namaqua Doves showed a distinctly different drinking pattern to the other species, fluttering down to water in loose, streaming flocks of five to 10 birds during the hottest time of the day when other species (except for ▷



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small numbers of finches) were largely absent. In effect, waterholes were generally dominated by a particular group of drinking birds at any given time of day.

Overall, the frequency of raptor strikes was highest when the activity of drinking birds was most agitated, so most of the action took place in early to mid-morning, with a secondary peak in mid- to late afternoon. Inevitably, raptor behaviour was also influenced by weather conditions. In the extreme heat of summer, we saw few strikes in the middle of the day. Interestingly, Red-necked Falcons seemed particularly sensitive to heat – we saw few ‘Red-necks’ during our March visit, and they seemed to become almost crepuscular. In contrast, Lanners hunted from thermals during the middle of the day (especially in winter) and this was the only time of day we recorded reasonable strike frequencies when relatively low numbers of drinking birds were at waterholes.

**C**omplicating these schedules of drinking and hunting, there was a lot of variation between waterholes in the species mix and absolute

numbers of visiting birds. We soon concluded that the waterholes that offered the best viewing options within striking distance of our base at Nossob restcamp were Rooikop (just south of Nossob), Lekkerwater (at the camp itself) and Cubitje Quap, Kwang, Leiersdraai and Kannagaus (increasing distances north of Nossob).

Most waterholes featured a predominant prey group and a corresponding suite of attendant raptors. Leiersdraai and Kannagaus attracted the most impressive finch flocks and by mid-morning at both sites the air was charged with the chattering and wing-whirring sounds of many hundreds of small birds, sporadically pouring from the crowns of nearby camelthorns to briefly go down to water, then losing their nerve and funnelling back into the trees. These gatherings were frequented by all three raptor species, but were particularly favoured by the Gabars, whose dashing forays up into the tree canopies from below caused the finch flock to explode dramatically through the canopy roof. Cubitje Quap and Kwang were the main dove venues. Typically, droves

*Namaqua Sandgrouse operate on a very tight schedule: they aggregate at Kalahari waterholes, move in to drink and then leave the area, all within a two-hour period in early to mid-morning.*



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of turtle doves ghosted into the vicinity of these waterholes just after first light and just before dark, building up to a threshold number, and then descending more or less as one to slake their collective thirst. The resulting tumbling mass of grey bodies was often targeted by Lanners, making long, low, strafing runs, cutting through the woodland and bursting over the waterhole, using both speed and cover to achieve maximum surprise. Sandgrouse were only really plentiful at Cubitje, although reasonable numbers also visited Rooikop.

Ultimately, it seemed that raptor activity at waterholes was pretty much a function of prey numbers. Generally, we saw the most raptor strikes at the waterholes that featured the most prolific aggregations of drinking birds. At the best waterholes (for example Kannagaus and Leiersdraai) we recorded upwards of 30–40 strikes per day, while at the poorer sites (such as Lekkerwater and Kwang) we saw fewer than 10 strikes per day. The attentions of all three raptor species were largely focused on the finch aggregations, which were often large, noisy and chaotic. Generally, only

Lanners made serious attempts to catch the larger prey species, and contrary to previous accounts of raptor activities at Kalahari waterholes, we saw very few serious strikes at sandgrouse, even by Lanners, during our time in the field.

The size of bird aggregations at waterholes varied enormously (for example, total sample counts averaged from about 250 birds drinking per day at Marie se Loop to more than 6 000 birds per day at Leiersdraai). This variation was probably the result of fluctuations in local resource conditions (rainfall is very patchy in the Kalahari, localising grass growth and seed production, which may concentrate granivores into the vicinity of particular waterholes only) or water potability (some of the boreholes yield very saline, essentially undrinkable water). Numbers of birds drinking were almost certainly not sensitive to changes in raptor predation pressure. Similarly, variation between species in the timing of aggregations at water was probably less a reflection of differences in susceptibility to predation than the result of basic differences in biology and physiology. It is likely, for >

*Cape Sparrows were particularly numerous in the Kalahari during our study, and swarmed around selected waterholes in mid- to late morning.*



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*An adult Lanner with a Spotted Sandgrouse. We saw few attempts by Lanners to take sandgrouse, perhaps because the numbers of grouse visiting waterholes during our study were quite low. Given their speed off the mark, sandgrouse may only be realistic targets for falcons during frenzied aggregations of many hundreds of birds.*

example, that sandgrouse only arrived at waterholes by the middle of the morning because many of them had travelled long distances from their feeding or breeding areas.

**B**ecause free-flying birds are particularly elusive prey, bird-eating raptors generally record relatively low hunting success rates. In this context, the hawks and falcons we observed at the KTP were quite efficient bird-hunters, with the Gabars and the Lanners achieving overall success rates of about 10–15 per cent and the Red-necks operating at about 20 per cent. All three were most successful when hunting finches; in fact, the two smaller raptors made no successful strikes at either of the other prey groups. Of the successful strikes we saw, probably the most memorable were executed by Lanners. During our efforts to secure

quality footage for the BBC, we spent a number of days at the Leiersdraai waterhole, hoping to film the Lanners hunting finches at midday. The process involved picking up a distant falcon on the horizon as it started to soar, following it up into the brilliant blue Kalahari sky, and tracking its movements with binoculars until its body language suggested that it might be about to make a strike. It was then imperative for the BBC cameraman (Barrie Britton) to get the bird in frame and pan with it as it moved in for the kill – a task much easier said than done! The final product, which makes up the opening sequence of the ‘Meat eaters’ episode of the ‘Life of Birds’ series, is testimony to Barrie’s consummate skill with the camera, coupled with some very clever work by the BBC editing team.

By far the most efficient raptor foraging we saw during this study involved

a unique and fascinating partnership between Red-necked Falcons and Gabars. We saw these small raptors hunting together on a number of occasions, and it seemed that for some pairs or individuals this interspecific teamwork is a regular part of their daily activities. The respective skills of the two hawks complement one another very effectively, with the Gabars chasing and flushing birds attempting to take cover and the falcons swiping at any birds exposed in free flight. Hunting in combination, both species achieved vastly improved hunting success rates of more than 40 per cent, and provided us with some exhilarating entertainment as they moved together like quicksilver through the woodland.

**D**uring some of the most exciting times we spent watching raptors at the Kalahari waterholes, we



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saw other visitors drive into the designated viewing points, stop briefly, then drive on, completely oblivious to the avian drama unfolding before them. A disconcertingly large proportion of visitors to the KTP seemed to be there only to see the dramatic carnivores for which the area is renowned. The rather remote possibility of seeing a lion or perhaps a cheetah kill is what lures Land Rover-loads of tourists from the confines of the restcamps each morning, out into the bleak semi-desert of the park. The vast majority return at the day’s end enriched by their experiences but without first prize. Very few ever knowingly witness the drama of the hunt. Fewer still realise that a couple of hours spent watching patiently at the right waterhole, at the right time of day, could reward them with in-your-face views of as many as five or six predation attempts, with enough action to attract even David Attenborough and his BBC documentary team. □

*We would like to thank Fergus Beeley and Barrie Britton of the BBC; Geel, Rentia and Dries of SA National Parks; and Zelda Bate, for their assistance with this project.*

*At any given time there’s generally a Gabar Goshawk loitering in the shadows around a Kalahari waterhole. The small birds in the vicinity often give them away: as the little hawks flit from one tree to the next, the throngs of chirruping finches instantly fall silent, and then burst upwards through the canopy in a sudden cacophony of sound. This adult Gabar has had some success in the hunt, and is set to enjoy the fruits of its labours.*